DOCUMENT RESUME

ED 035 596 SP 003 474

TITLE	Summary of a Model of Teacher Training for the Individualization of Instruction. Summary of the Final Report.
INSTITUTION	Pittsburgh Univ., Pa.
SPONS AGENCY	Office of Education (DHEW), Washington, D.C. Bureau of Research.
BUREAU NO	BR-8-9020
PUB DATE	Oct 68
CONTRACT	OEC-0-8-089020-3309(010)
NOTE	29p.
EDRS PRICE	EDRS Price MF-$0.25 HC-$1.55
DESCRIPTORS	Academic Education, Educational Strategies, *Elementary School Teachers, Flexible Progression, Individual Development, *Individualized Instruction, *Teacher Education, Teaching Experience
IDENTIFIERS	Specifications for Elementary Teacher Education

ABSTRACT

Individualized instruction is the central theme of a model for the preparation of elementary school teachers, and this theme is developed through the inclusion of unique features such as emphasis on program flexibility, student self-development, and learner efficiency. These unique features are incorporated into an academically and clinically sequenced general training plan (which includes cognitive input and affective and field experiences) for a program which has five requirements: academic education, professional education, training for teacher competencies, a clinical setting, and a guidance component. The plan also endorses a general instructional mode for all levels of learning. Student progress through the program is adapted to the individual and is accounted for by admission criteria, guidance procedures aimed at professional and personal self-development, and four-stage course selection by the student through the academic and clinical sequences of the model leading to a bachelor's degree in education. The costs of instructional materials development, faculty retraining, administration and coordination, space, evaluation, and general funding will affect the cost of program implementation. (The complete report is ED 025 495. This summary was previously announced as ED 032 265.) (SM)

ED035596

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SUMMARY OF THE FINAL REPORT

Project No. 8-9020
Contract No. OEC-0-8-089020-3309 (010)

SUMMARY OF A MODEL OF TEACHER TRAINING FOR THE INDIVIDUALIZATION OF INSTRUCTION

UNIVERSITY OF PITTSBURGH

October 1968

The research reported herein was performed pursuant to a contract with the Office of Education, U.S. Department of Health, Education, and Welfare. Contractors undertaking such projects under Government sponsorship are encouraged to express freely their professional judgment in the conduct of the project. Points of view or opinions stated do not, therefore, necessarily represent official Office of Education position or policy.

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SUMMARY *

I. Introduction

Individualized instruction has been an ageless dream of the schools of America. The years of effort and dialogue have resulted in very few plans and operations of this idea which could withstand rigorous examination. Through the years, this dream has turned into a dilemma as teachers have been urged by many to individualize programs only to be confronted with the reality of training lag, an economic restriction, and an operational void which exists because so few acceptable models of this concept are available.

The central theme of the new Model for teacher training is individualized instruction. A general definition of individualization is as follows: Individualized Instruction consists of planning and conducting, with each pupil, programs of study and day-to-day lessons that are tailor-made to suit his learning requirements and his characteristics as a learner. This definition focuses on instructional planning with and for each individual student before teaching him, then teaching him according to the plan. Most educators mistakenly define individualization in terms of the setting within which learning takes place, limiting it to tutorial instruction or independent study.

Group teaching can also be a part of individualized programs. Whenever, at the same time, two or more pupils are ready to study the same task in a like way through group presentation or discussion, it is proper for the teacher to assemble and teach them as a group. This is very different from most instruction today where plans are made for the group as a whole and where instruction pays limited attention to individual differences among pupils in the group. It has been assumed by the authors of this proposal that principles of individualized instruction should be used throughout the educational experience. Thus, while this model is specifically addressed to the preparation of teachers for levels of instruction within an elementary school, it is applicable to other levels.

Several chronic problems of education are directly related to the issues of individualized instruction and teacher preparation. Paramount among these concerns is in-service education. Slowly we are coming to acknowledge the obsolescence in our skills to individualize instruction. The programs of the past have been futile. In the future, we will find a new approach as training, self-development, and self-renewal become features of the daily operation of the school. This model proposes a way of preparing new professionals and upgrading the licensed practitioners to individualize instruction.

* - Pages 69 through 98 (Chapter 5) of the final report.

Individualized instruction is the central theme of the University of Pittsburgh Model. In preparing this plan, we intended it to be clear that while such individualized programs as IPI, PEP, and PLAN have been cited in this text, the Pittsburgh Model is not a teacher training program only for that form of individualization.

In a general sense, the proposed program is quite similar to many existing plans. The student will continue in liberal arts study for the first part of his preparation. The remainder of his program will consist of several experiences in a school setting.

Major differences exist between conventional teacher education programs and the proposed model. An illustration of this point would be the matter of program flexibility -- a critically important trait of individualized instruction. In the Pittsburgh Model, this attribute will be evident as a student obtains the liberal arts ~~a~~ out because instructional modes will be used which allow for different rates and styles of learning. Flexibility also will be obvious as students assume more responsibility for making decisions about their training. The distinction of flexibility will be noted in program planning, for no longer will courses be offered with vague descriptions regarding purpose and goals. Rather, smaller, more precise units of instruction will be used and students will have a greater opportunity to tailor the program according to their needs. This trait also will be visible during student teaching and interning for these experiences also will be adjusted to the individual.

Flexibility is a discernible trait of the proposed instructional mode. Individualized instruction as herein proposed begins with an appraisal of the learner. Instruction is then adapted to the individual. Within a reasonably short time, the effectiveness of that treatment is judged for the purpose of adjusting activities to the learner once more. This cycle, which is brief, in time, appears as an appropriate plan for individualizing instruction.

Flexibility is carefully linked to self-development which is another unique feature of the Pittsburgh Model. The adjustments previously cited in program and instruction enable self-development in a gross manner. However, underlying this focus is the reasonable assumption that students will relate to pupils in a more helpful manner if the preparation period is marked by accepting and helping behavior by the faculty.

Self-development has another dimension. It will be noticeable in the prolonged attention to group process in the model. By this technique, the student will learn how to help others identify personal

strengths and weaknesses. In so doing, students will gain new insights into their own behavior.

The teacher educators who prepared this model believe that individualized instruction is a means to a more significant goal. It will be a useful means only if it helps each child in his quest for identity. This is an endeavor of the highest priority. It is an endeavor which cannot rely totally on good equipment and material. It is an endeavor which progresses on the basis of human relationships. Thus, the teacher, or the student of teaching, must be prepared to fill this critical role. This is the contribution of self-development, for as the teacher knows himself, he will be better equipped to help others know themselves.

Learning in the fashion of the Pittsburgh Model also is marked by the concepts of mastery and efficiency. With regard to mastery, the trainee will be expected to demonstrate that learning goals have been met. Movement to another set of goals will be predicated on previous indications of mastery. However, mastery will not imply rigid standards of performance for all trainee's.

Efficiency is related to the flexibility feature. In relation to efficiency, the program will be adjusted to accommodate individuals in terms of what he knows, how he learns, and what he selects to learn. Thus, a flexible program is essential if learning efficiency is to be recognized.

The five requirements met by this model component are: 1) academic education; 2) professional education; 3) teacher competencies, 4) a clinical setting; and 5) a guidance component. The model follows a general plan for preparing a person to participate in activities involving human behavior. This general plan includes cognitive input, affective experiences, and field participation sufficient to appraise the trainee's personal and professional development. These elements are placed in a network as follows:

1. GENERAL TRAINING PLAN

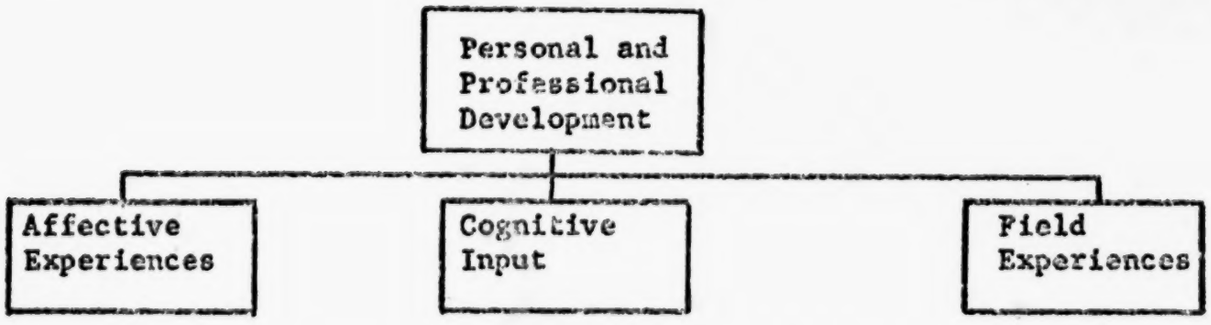


Figure No. 14. General Training Plan for Self-Development

The structure of the proposed model is more specific than the previous diagram. The sketch below illustrates the factor as it is perceived at this time: The trainee,with his advisor, will select learning units at four different stages.

UNIVERSITY OF PITTSBURGH MODEL

SEQUENCE AND STRUCTURE

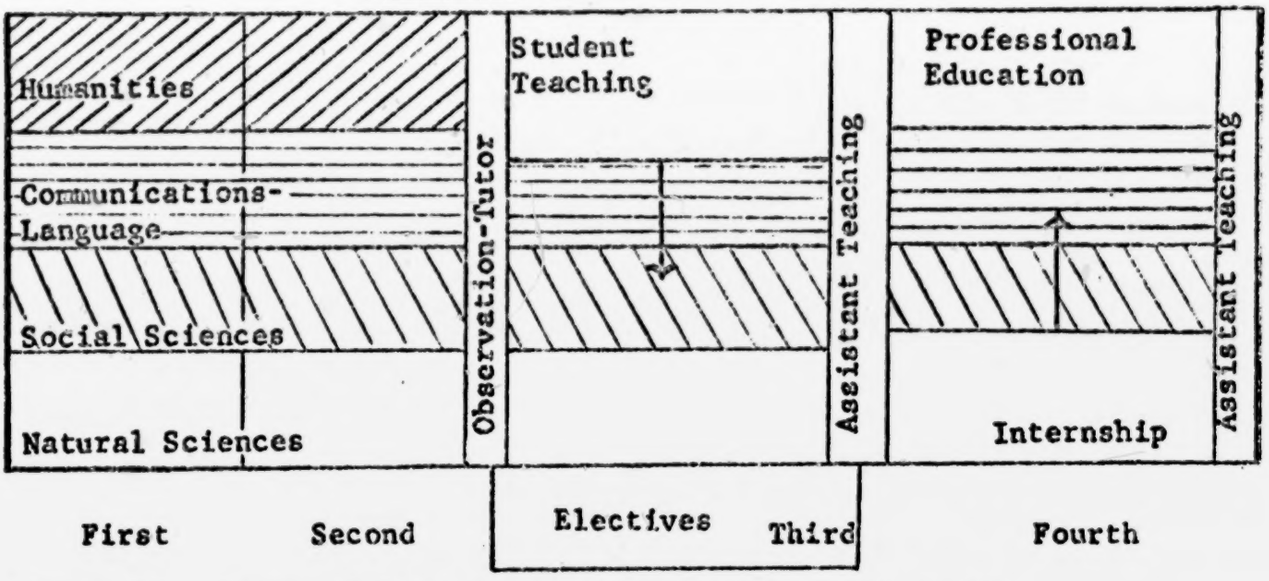


Figure 15. Sequential Progress of Trainee B.A. Education

Another facet of this model pertains to the instructional mode. This plan does endorse a strategy for teaching which could be used at all levels of learning. The diagram which follows contains the general plan:
1) Specify learning goals, 2) Assess, 3) Diagnose, 4) Plan, 5) Guide, and 6) Evaluate.

Many elements of this illustration could be developed more elaborately without violating the basic design. The following schematic illustrates this point:

UNIVERSITY OF PITTSBURGH MODEL

GENERAL INSTRUCTIONAL MODE

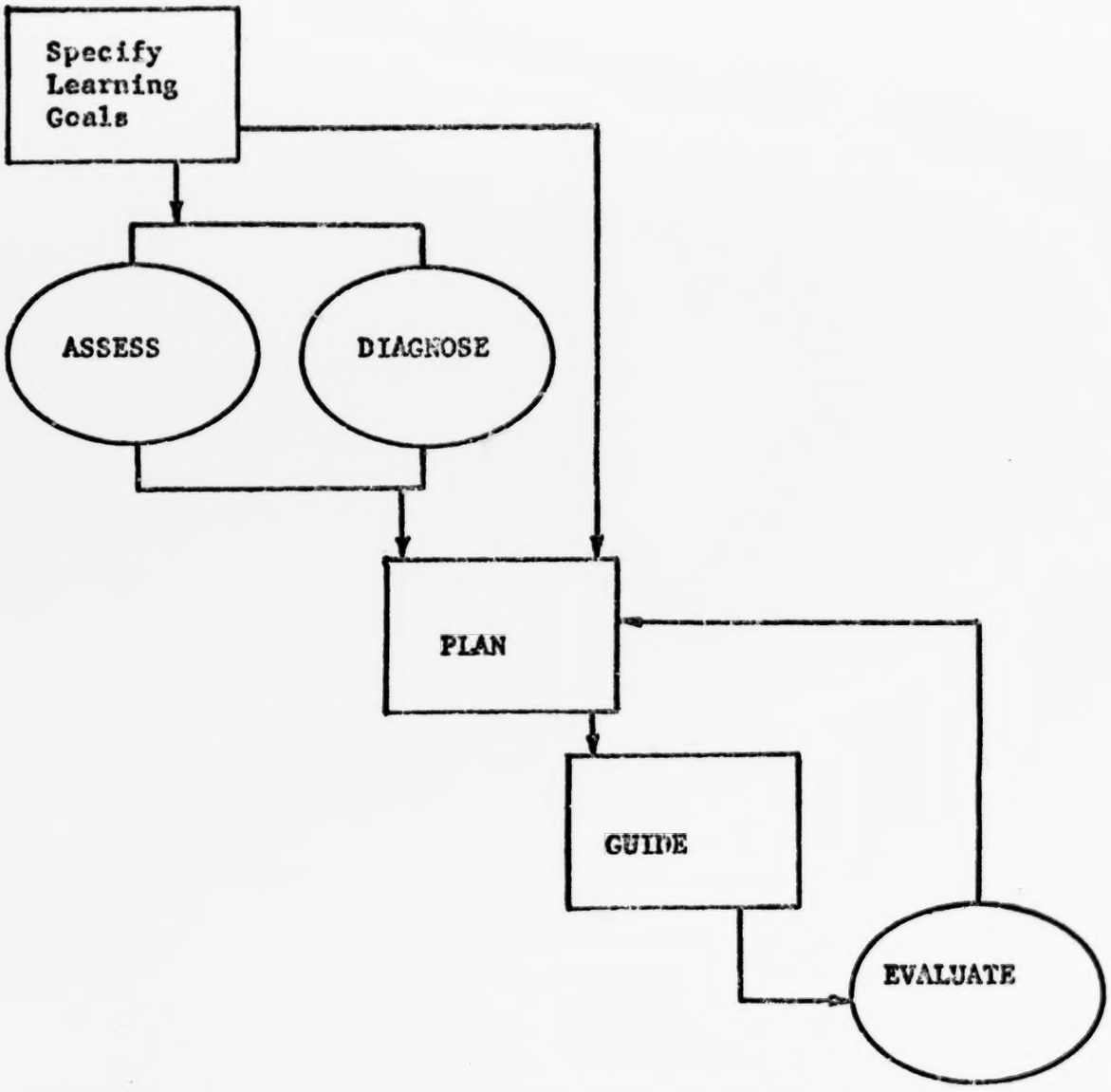


Figure 16. GENERAL INSTRUCTIONAL MODE TO BE USED BY ALL WHO PARTICIPATE IN TRAINING TEACHERS

UNIVERSITY OF PITTSBURGH MODEL
MATHEMATICS EDUCATION FOR ELEMENTARY TEACHERS
LEARNING MODULE *

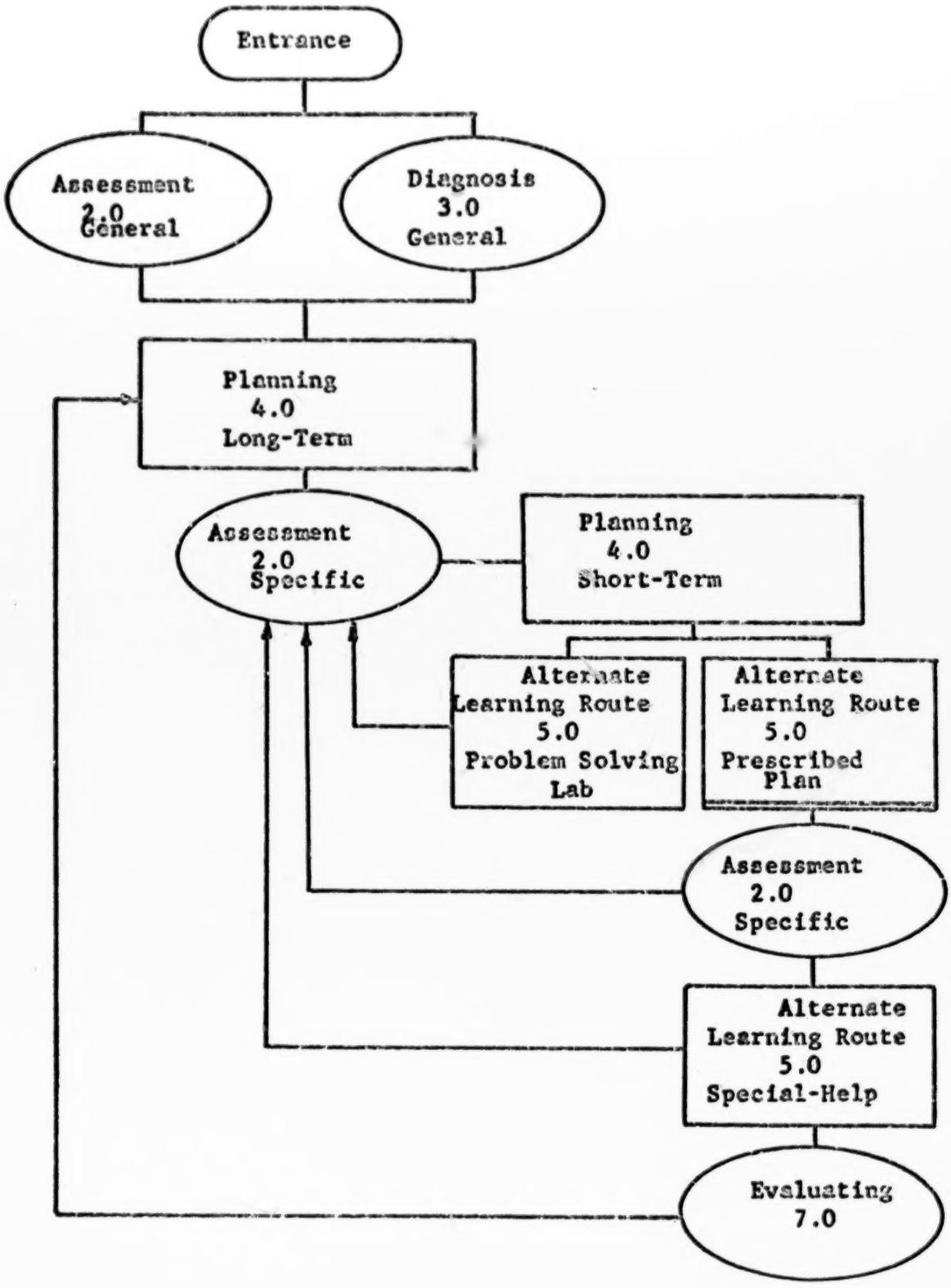


Figure No. 17. General Teaching Mode for Mathematics Education.

*See Appendix for additional information.

II. Description of the Requirements of Teacher Training

The liberal education of the teacher trainee rests on a broad survey foundation in the liberal arts. For purposes of dialogue about this model the authors group Academic Disciplines into four areas; the humanities, communication and language, social sciences, and the natural sciences. The general survey nature has been governed or conditioned in the past by the amount of time for study in a four year curriculum and the self-contained organization pattern which predominates in the American elementary school. The flexibility of the Pittsburgh Model will permit the trainee to acquire different experiences more easily at his own pace, based upon mastery. Further, the implementation of the instructional mode by professors at the university will provide many more alternate routes in pursuit of mastery in the liberal arts area. By systematically helping trainee's gain command of content structure, key concepts, principles, and modes of inquiry in a discipline, the very nature of liberal arts can become more relevant for future educators and all students.

The knowledge base for establishing a profession of teaching has its roots in the liberal arts with its focus upon inter-disciplinary relationships. The trainee must implement knowledge about curriculum, instruction and the learning process as particularly influenced by sociology, psychology, communication, and anthropology. Of paramount importance to teacher training programs is the extension of the knowledge base upon which teaching can become a profession. Knowledge of change processes, systems analysis, research methodology, teacher decision-making analysis, and formative and summative evaluation procedures are prerequisite to faculty implementation of the Pittsburgh Model for Individualization of Instruction.

For teacher training to move to a competency base it will mean a foreclosure upon the accumulation of course credits, grades, semester hours within rigid semester organizational patterns. The successful application of knowledge with pupils in accepted instructional modes in the judgment of clinical faculty will be the criterion for certification in the future. The adoption of the basic instructional mode by the college instructor of liberal arts will permit the trainee to pre-test and posttest unit experiences at his own pace. Tests in this case will be more than paper and pencil in nature. A competency means the ability to know, understand, and demonstrate a specific task at or above an indentified level of performance. Such concern about transfer of credit, and temporary certification would diminished or accommodated by competency capability.

The guidance of teacher trainee's should be predicated upon development of self-direction, awareness of self, and the skill in working professionally with children and colleagues. Through a varied pattern of relationships with faculty and peers, trainee's must overcome impersonalization, loneliness, feelings of powerlessness about affecting change, and dependence upon direction from authority. The confidence of self must stem from the expertise and mastery gained in training.

Clinical settings for training are required to link preservice and in-service programs for teachers. The clinical setting cannot be established without a new coalition between colleges, schools, teacher organizations, and state or federal agencies. The relationship between theory and practice can achieve some consistency when teacher training coalitions establish environments for training that truly represent the most explicit behavior models and techniques desired in pushing teaching to new levels of performance. In-service retraining of teachers must become a professional obligation of the school district, teacher organization, and the related agencies of government. It must be cast in closer proximity for solving solution of problem in education. A clinical setting must feature, service to children, training for teachers, and extension of the knowledge base for teaching. In the case of individualization of instuction, it must provide a curriculum and materials to support this philosophy of organization for learning.

The implementation of the Pittsburgh Model is considered in direct relationship to the requirements of teacher training and the general specifications for each component.

TABLE V THE UNIVERSITY OF PITTSBURGH'S FIVE REQUIREMENTS FOR TRAINING TEACHERS

Requirements	Specifications	Implementations
ACADEMIC EDUCATION	Communications	Mobilize departments for the study of individualized instruction
	Humanities	
	Social Sciences	Refinement of the instructional mode of the faculty
	Natural Sciences	
		Develop units of instructions
		Coordinate the above and offer to program

TABLE V: FIVE REQUIREMENTS FOR TRAINING TEACHERS (continued)

Requirements	Specifications	Implementations
PROFESSIONAL EDUCATION	Study of the problems that grow out of working with children	Mobilize department for the study of individualized instruction.
	Collecting data for extending the knowledge base	Refinement of the instructional mode of the faculty
	Collecting data for refining the model	Develop units of instruction
		Coordinate the above to the program
COMPETENCIES	Competencies 1 through 7 of Chapter II	Working through the instructional mode until the faculty demonstrates mastery of competencies 1-7
GUIDANCE	Clinical Team processing	Working through the instructional mode until the faculty demonstrates mastery of competencies 8 and 9
	Individual counseling	
	Group directing	
CLINICAL SETTING	Servicing children	Establish a strong coalition among school district, university teacher organization and state and federal agencies
	Training personnel	
	Extending the professional knowledge base	

ACADEMIC EDUCATION

The liberal arts specifications of communications, humanities, social sciences and natural science form the basis for most training institutions. In the Pittsburgh Model the specifications are utilized in an individualized program.

Beginning with the mobilizing of each department for individualization the liberal arts faculty will be retrained and new units of instructors will be developed before the program will be offered. Each liberal arts department must study the conditions for individualized instruction and a new faculty instructional mode should evolve.

PROFESSIONAL EDUCATION

The professional education requirements addresses itself to learning theories, child development, psychology, etc. i.e the study of the problems that grow out of working with children. The professional education requirements also deals with collecting data for 1) extending the knowledge base and 2) refining the model. As systems of data collecting are refined, extending the knowledge base and refining the model, provide the basis for evaluation, restructure and change.

The implementation of the professional education requirements follows the same procedure as that found in the liberal arts requirements.

COMPETENCIES

The competency specifications are: 1) specifying learning goals, 2) assessing pupil achievement of learning goals, 3) diagnosing learner characteristics,,4) planning long-term and short-term learning programs with pupils, 5) guiding pupils with their learning tasks, 6) directing off-task pupil behavior and 7) evaluating the learner. The conditions of each of the above competencies must be evident in both the faculty and the finished product - the pupil.

Implementing the competency requirement must involve the faculty working through the instructional mode until they demonstrate mastery. No university or training institution can hope to implement an individualized program until the faculty is able to perform in the manner they wish to train.

GUIDANCE

Clinical team process, individual counseling and group directing are the specifications for the Guidance requirement. These specifications require the trainee to have several methods of obtaining relevent feedback for self-realization, self-development and self-evaluation.

Utilizing the eighthand ninth competencies, 8) employing team work with colleagues and 9) enhancing self-development requires the same procedure of implementing as that found in competencies above and for the same reason.

CLINICAL SETTING

The specification surrounding the clinical requirements are ones of servicing, training and extending. Training personnel certainly is the first consideration for any training institution, however, servicing children is also a vital function and should not be overlooked. Extending the professional knowledge base is a direct outgrowth of a clinical setting and will aid in outlining new directions as well as new procedures.

The clinical setting requires a new form of cooperation - a new coalition. No longer can the university hope to train teachers without the full support and cooperation of school districts, teacher organizations, state and federal agencies. This new coalition is essential for the implementation of any program designed to train teachers.

The University of Pittsburgh's Model is an attempt to bring together all of the forces required to insure a sound and far reaching program to not only train future teachers but to provide help and guidance to in-service teachers as well.

III. Student Progress Through the Model

In general the model follows the basic procedures of most instructional models, i.e., trainees are exposed to an instructional process in order to change their behavior as indicated by the specific goals and objectives of the program. In particular, the Pittsburgh Model is unique in its commitment to assisting each teacher trainee in achieving a viable system of self-development. The admission and guidance components exemplify this concept by including a thorough process of induction, interaction and reflection for the trainee.

Also unique is the flexibility of the model which will permit and facilitate individual program designs for EACH trainee. The model provides an opportunity for the trainee to help select and determine the nature and extent of his training experience. These features represent a determined effort to design a program which will emphasize the individualization in learning.

Two other major differences which make this model unique from most other models of instruction are the criteria of mastery of efficiency. In relation to mastery, the trainee will be expected to work through an ordered set of objectives, in the most effective way, until he reaches a specified degree of competency. Then he moves on to another unit. In relation to efficiency, the program will be individualized in order to provide the most efficient progress for each trainee and for the conduct of the total teacher training program. Efficiency here means that a trainee will not have to work in areas where he already has mastery, that his progress in the program will be geared to his own rate of learning without the arbitrary time limits usually imposed by courses or credits in more conventional programs.

1. Process of Admission to Professional Education Program

The general criteria for admission to the Education program are the following: a) that the candidate enjoys success and multiple interests among the academic disciplines; b) that he presents evidence that he is interested in and somewhat successful in helping children and adults; c) that he utilizes the American language and communication patterns well; d) that he is self assured and confident; e) that he has good physical health; f) that his total life pattern represents broad interests; g) that he indicates open and acceptant attitudes plus understandings based on reliable

and valid knowledge of all peoples in this society; h) that he understands the specifications for the teacher training program and agrees to work toward mastery.

Since the potential of the candidate, and the nature of his initial attitudes and commitment, will be very important in the admission stages of this model, guidance begins with the review and summation of the trainee's proficiency through the academic disciplines and observation experiences. The following chart shows this process. Notice that the model's flexibility provides for both admission and exit of trainees in more than one area, according to demonstrated mastery of the academic and clinical experiences. Upon admission, the trainee is assigned to an adviser.

2. Guidance Procedures

The guidance function, as presently practiced, guides the trainee through course requirements, but it does not aid in self-development. In the new model, however, guidance facilitates a more personal involvement. This is shown in the three settings outlined below. The entire process is aimed toward self-development, both professional and personal.

GUIDANCE PROCEDURES

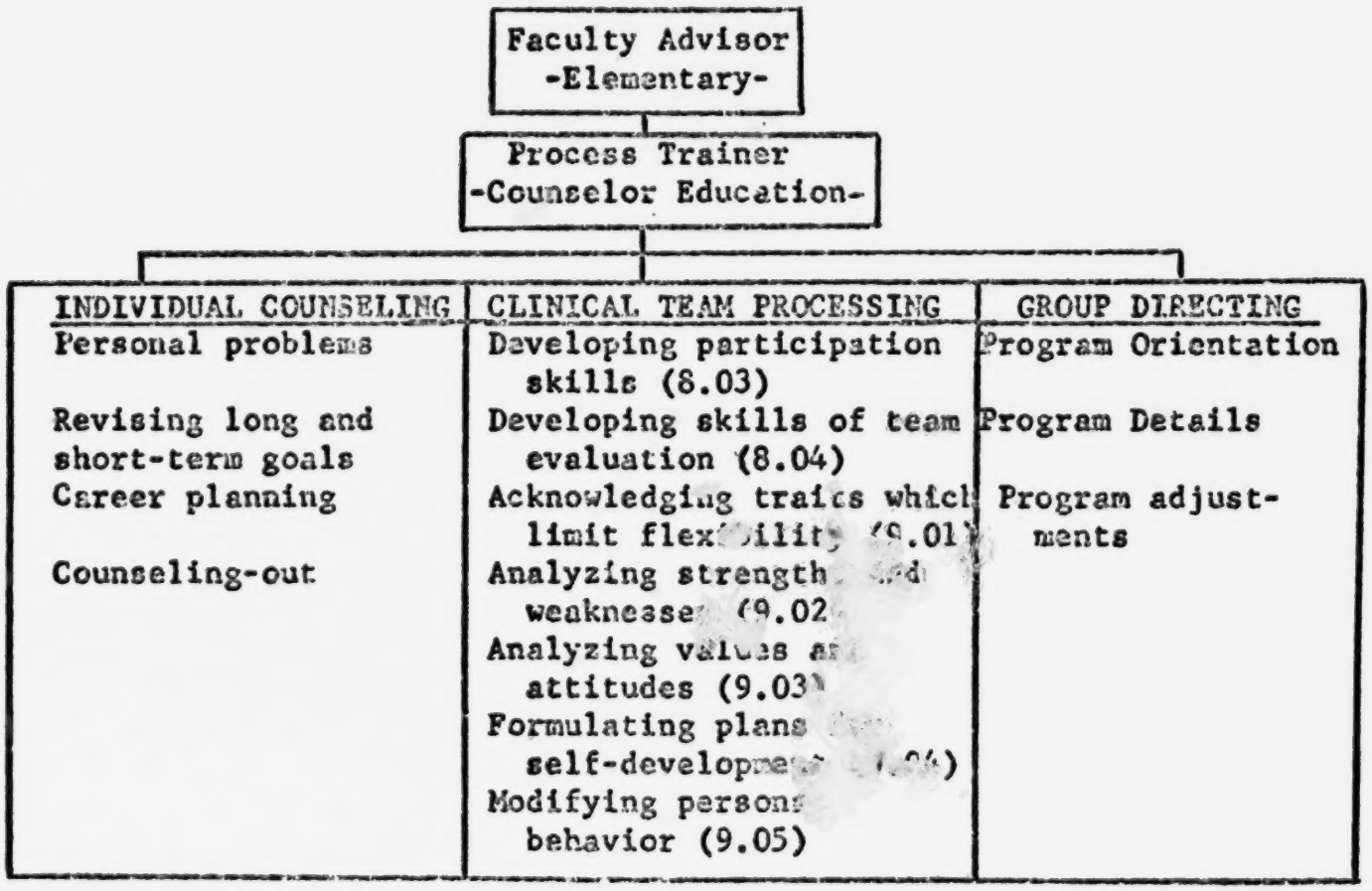


Figure No. 18. Guidance Procedures

ADMISSION TO PROFESSIONAL EDUCATION

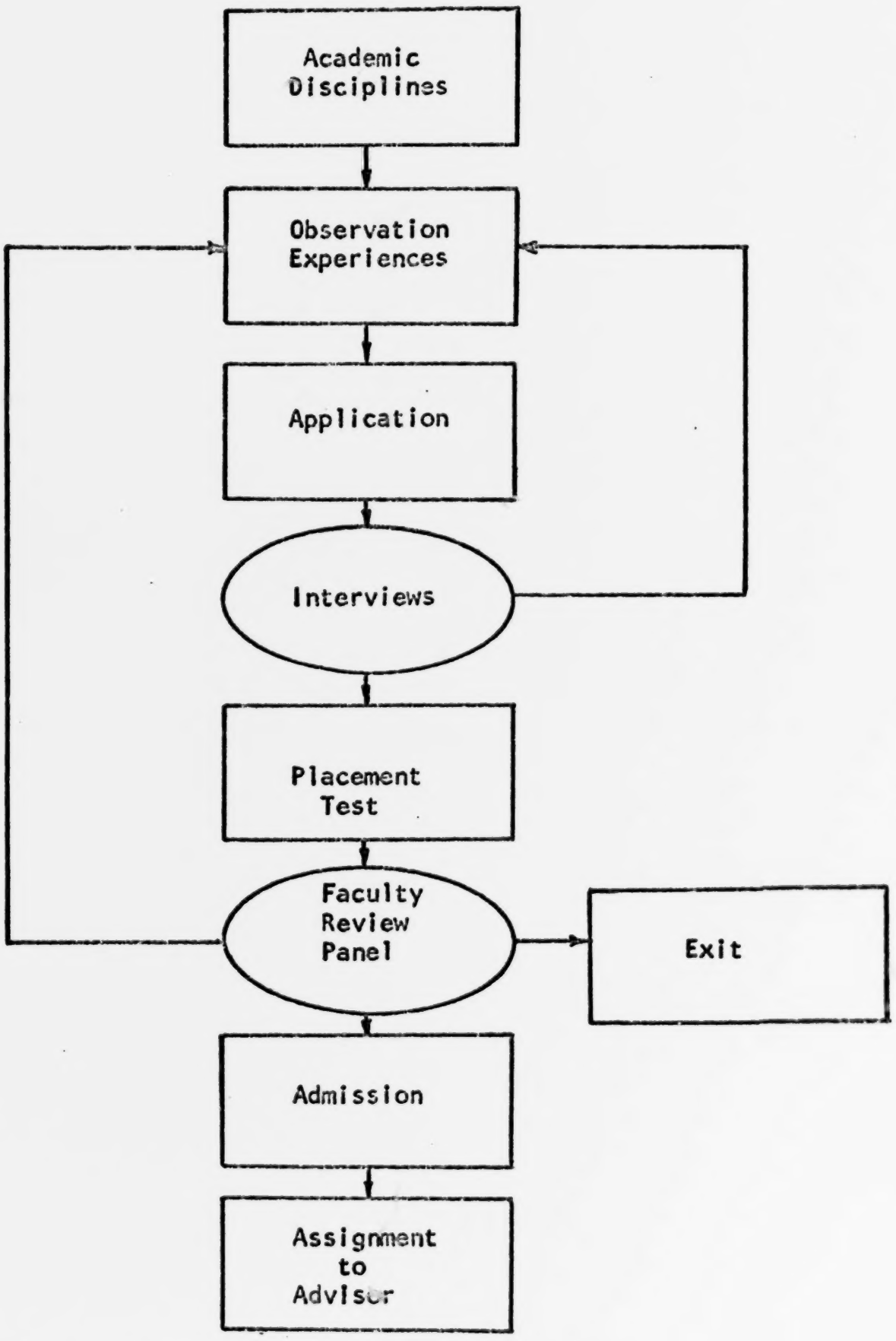


Figure No. 19. Shows Admission and Exit Procedures

With this emphasis on the individual, a trainee can expect to be a partner in determining his movement through the college program. No longer will a student be exposed only to the large lecture classroom organization. Peer group interaction, independent study, small seminar group sessions, and simulated modules of instruction will aid him through his college program.

3. Course Selection (Unit Experience)

The trainee will select courses (or learning units) at four different stages according to an ordered subset of learning units desired for fulfilling the requirements for B.A. in Education. This subset is selected either on the basis on long-term objectives, short-term objectives in that stage, performance in the previous stage and factors such as facilities available at school, requirements laid down by the school board and the individual.

The following chart and its sub-divisions present the total sequencial movement of a teacher trainee through the four sequences of the new model, terminating at the B.S. in Education Degree at the completion of 32 learning units.

Below is a breakdown of the model sequence.

a. Academic Sequence - First Activities Series

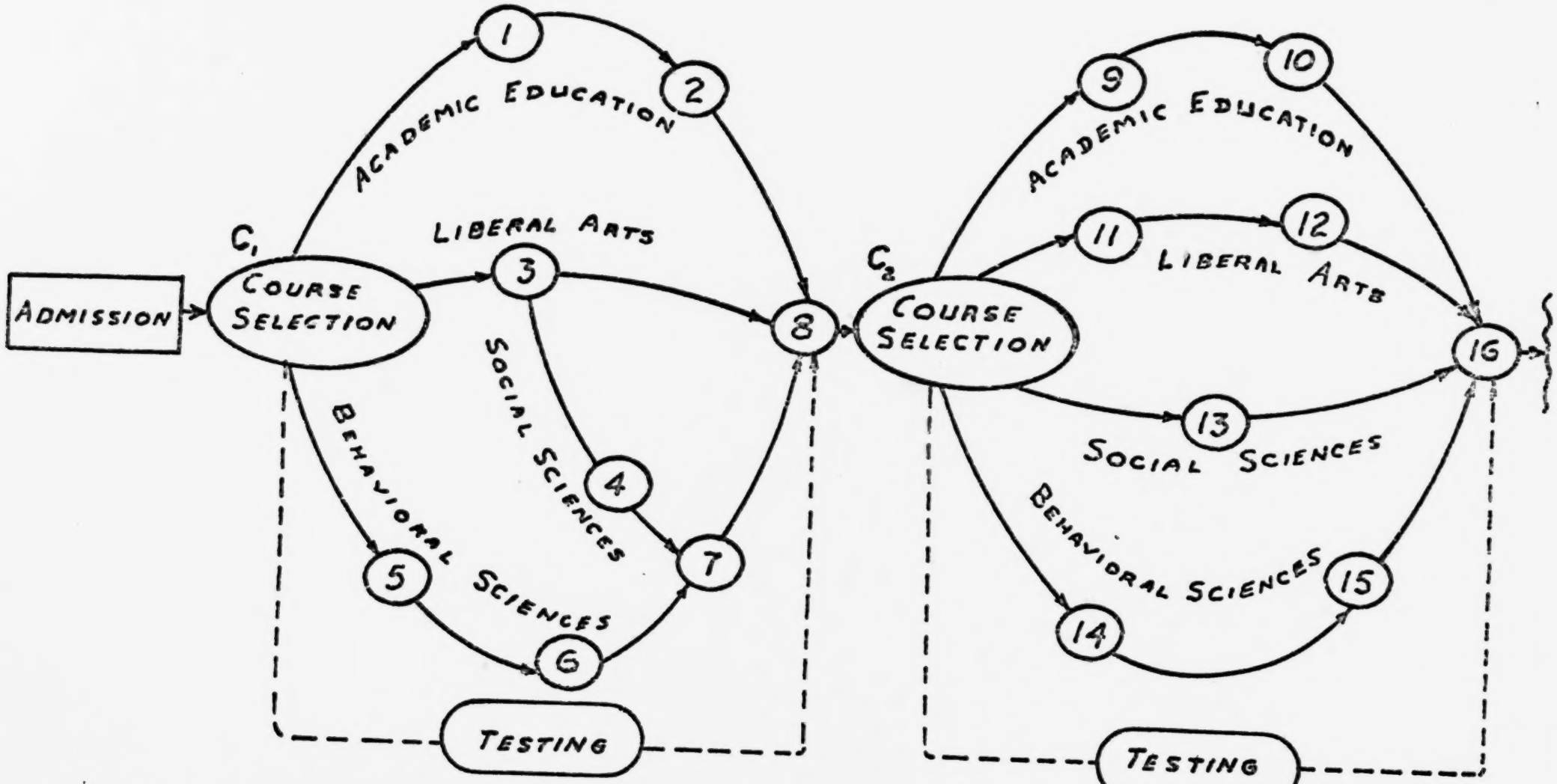
The arrangement of this series offers the teacher trainee a continuous content resource in the Liberal Arts, Behavioral Sciences and Social Sciences.

With his advisor the trainee will select learning units in the academic disciplines as a result of personal assessment and placement tests and/or as a result of needs discovered by content tasks.

b. Clinical Sequence - Second, Third and Fourth Activities Series

During the second sequence, the trainee will be scheduled to observe and participate in the activities of the clinical setting. Data will be collected about his attitude, inter-relationships and successes as a tutor. The behavioral data and faculty judgment will form a part of the new basis for full admission into the training program.

INDIVIDUALIZED INSTRUCTION: LEARNING SEQUENCES (Hypothetical Plan)



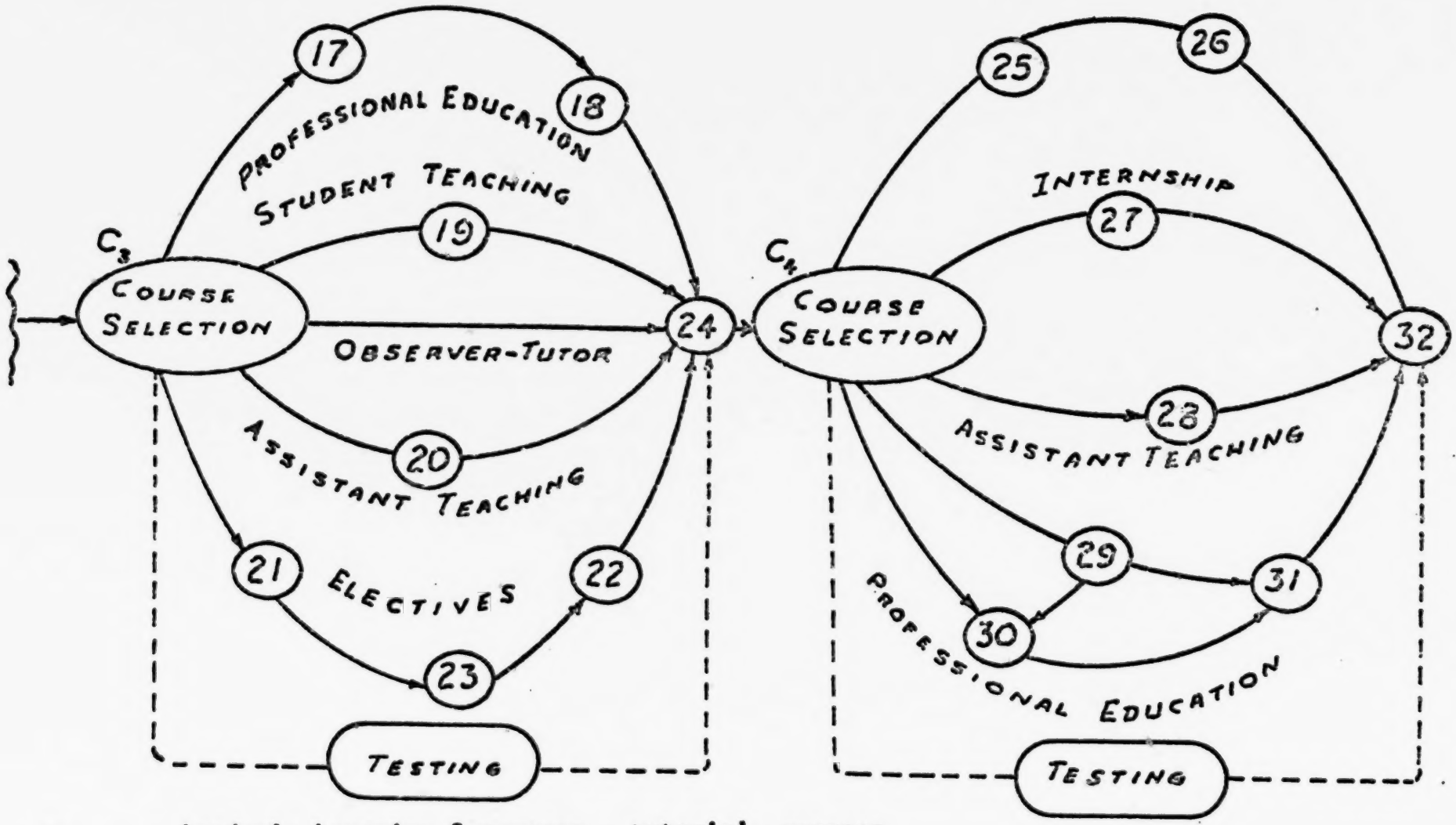
C_1, 2 - Academic Learning Sequences - tutorial, courses

C_3, 4 - Clinical Learning Sequences - tutorial, clinical

1, 2, ... 32 - Competency experience units needed for B. A. in Education

Figure No. 20. Total Sequential Movement of Trainee Through Program

INDIVIDUALIZED INSTRUCTION: LEARNING SEQUENCES (Hypothetical Plan)



$C_{1, 2}$ - Academic Learning Sequences - tutorial, courses

$C_{3, 4}$ - Clinical Learning Sequences - tutorial, clinical

1, 2, ... 32 - Competency experience units needed for B. A. in Education

Figure No. 20. (continued)

The amount of time devoted to this segment of the program by the trainee is in direct relationship to his interests and faculty assessment. For instance, he could be trained for specific observation skills which would facilitate data collection to advance the base of knowledge about human behavior.

At the end of the trainee's second sequence he will make application for a student teaching experience. His entry will be based upon appraisals made by his advisor and other faculty members.

During the third sequence, the trainee will serve a dual role. He will be an assistant teacher part of the time and a student teacher part of the time.

As a student teacher 100% of the trainee's time will involve working with pupils for the purpose of observing his level of mastery in the competencies. He will function in a team situation supervised by clinical faculty members.

The trainee, in his role as assistant teacher, will be provided clerical experience, teacher aide experience and tutoring experience while rendering valuable service to the clinical team.

This type of experience provides continuous contact with pupils in both small and large groups, and in all phases of an elementary school program.

During the fourth sequence pupil contact will continue. Team membership and each individual role or function will be analyzed. At this stage it is safe to assume some trainees will be exhibiting a great deal of competency mastery suggesting some experience in a leadership role of team or group.

At the internship level of experience, curriculum decisions, communication with parents, and other responsibilities will be added to his accountability range. The internship will continue until the specified degrees of mastery are achieved.

Cognitive units in liberal arts and education will continue to be scheduled by the trainee and his advisor until mastery of all required teaching competencies; in this case 32 units of learning.

On the preceding diagram of Learning Sequences notice the variable achievement rates between individual activity units. This defines the model's criterial nature of achievement: mastery of a unit of competency, instead of the traditional time measurement. The trainee advances as soon as he masters one specified learning unit.

The following flow chart shows the competency-unit experience in detail. Twenty trainees all start toward the same specified learning goal, but they use different learning techniques and arrive at the goal at different times. Individualized instruction can be either independent study or group study.

Summing up the training so far, we ahve been concerned with adapting procedures for admission, guidance and course selecting to the individual. This implies the theme of the Pittsburgh Model - Individualized instruction.

Individualized instruction, as defined by our model, must satisfy the following criteria:

1. That trainees are able to proceed toward mastery of the instructional content at varying rates.

2. That each trainee can make regular progress toward mastery of the instructional content.

3. That the units of instruction be determined by the competencies.

4. That trainees are involved in learning which is wholly or partially self-directed and self-selected.

5. That trainees are able to play a major role in evaluating the quality, extent, and rapidity of their progress toward mastery of successive areas in the program.

6. That materials, techniques of instruction, and classroom setting (both university classroom and clinical settings) are available so that instruction can be adapted to the individual needs of the trainee.

7. That trainees are engaged in the learning process through active involvement including a) involvement in selecting particular units to be studied, b) involvement with pupils either through a laboratory or clinical setting, and c) involvement in the learning process through such media as video tapes of their own performance.

Group study, then, does not violate the individualized concept; in fact, awareness of self can be more easily achieved when studied in relationship to others in similar circumstances, competencies better observed and mastered when working in a group or clinical setting.

INDIVIDUALIZED INSTRUCTION COMPETENCY - UNIT EXPERIENCE

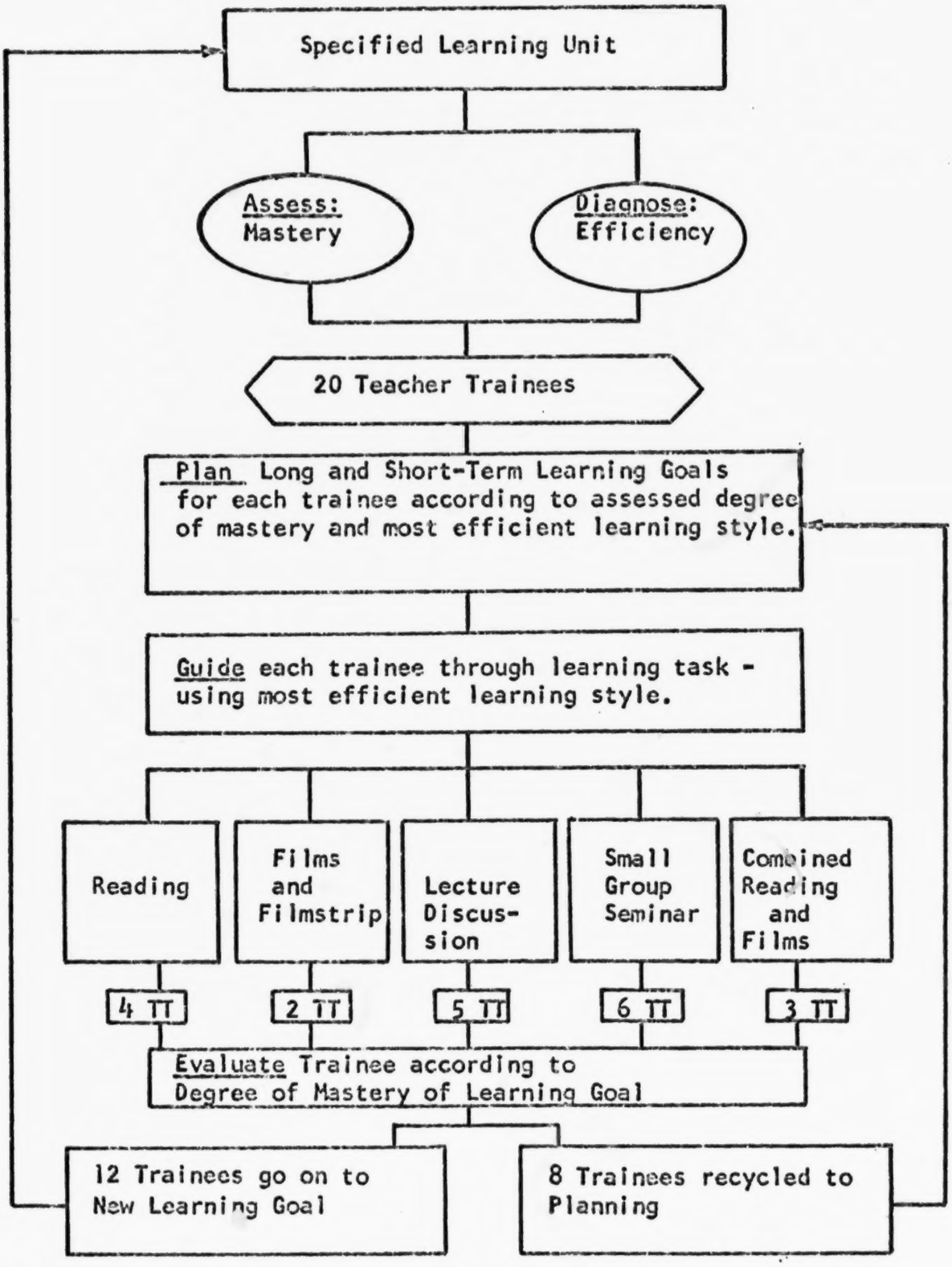

Specified Learning Unit
Assess: Mastery
Diagnose: Efficiency
20 Teacher Trainees
Plan Long and Short-Term Learning Goals for each trainee according to assessed degree of mastery and most efficient learning style.
Guide each trainee through learning task - using most efficient learning style.
Reading
Films and Filmstrip
Lecture Discussion
Small Group Seminar
Combined Reading and Films
4 TT
2 TT
5 TT
6 TT
3 TT
Evaluate Trainee according to Degree of Mastery of Learning Goal
12 Trainees go on to New Learning Goal
8 Trainees recycled to Planning

Figure No. 21. Competency-Unit Experience

Thus, the University of Pittsburgh Model is a flexible design. Its specifications are general. It is not complete in its present form. Even when implemented, it will need constant refinement, and change. However, the following aspects are cited to indicate how this model treats certain characteristics of individualized instruction.

> Individualized instruction should be commonly practiced at the college and university level.
>
> . . .This model proposes a general instructional mode for use at all levels of instruction.
>
> Individualization should be practiced in a fashion that encourages every learner to be a planner, director, and assessor of his own education.
>
> . . .This model includes a definition of teacher competencies necessary for individualizing instruction with attention to 1) specifying learning goals, 2) assessing pupil achievement, 3) diagnosing learner characteristics, 4) planning long-term and short-term programs with pupils, 5) helping pupils with their learning tasks, 6) directing off-task pupil behavior, 7) evaluating the learner, 8) employing teamwork, and 9) enhancing self-development.
>
> Individualized instruction is a demanding pursuit which requires the talents and energies of the entire profession.
>
> . . .This model proposes a new coalition which includes school districts, universities, teacher organizations, and state and federal agencies.
>
> . . .This model proposes that professional staffs work in teams to meet the wide range of needs of learners.
>
> . . .This model proposes that we learn to be effective team participants.
>
> . . .This model proposes a new linkage between pre-service and in-service training such that in-service education becomes a part of the daily operation of the school.

Individualized instruction demands a new partnership between the pupil and teacher to accommodate the human variable in learning.

. . .This model proposes that each teacher trainee initiate a process of self-development as well as professional development.

1. Figure 22, shows the Gestalt or the total programs for training teachers for individualized instruction.

Individualization is a process demanding continual refinement.

. . .This model proposes a systematic feedback system of the training experience so that the process remains relevant to the needs of trainees.

2. Figure 23, shows the self-regenerating feedback system which affects all components.

Through decision analysis, each component is assessed and evaluated, not only for its own internal consistency, but for its interdisciplinary relationship and, also, for its relationship to the philosophy of the model itself.

The Philosophy of Individualization

The philosophy of individualization is one of change, and any institution bidding on this model should make this commitment. When this vital first step has been completed, the institution can proceed to the subsequent steps which result in total implementation.

3. Figure 24, shows this process of implementation by the bidding university.

The Estimated Cost of Individualization

Also of interest to the implementor is the probable budget necessary for individualization of instruction. Following is an estimated budget for implementation.

UNIVERSITY OF PITTSBURGH
PROGRAM REGENERATION SYSTEM

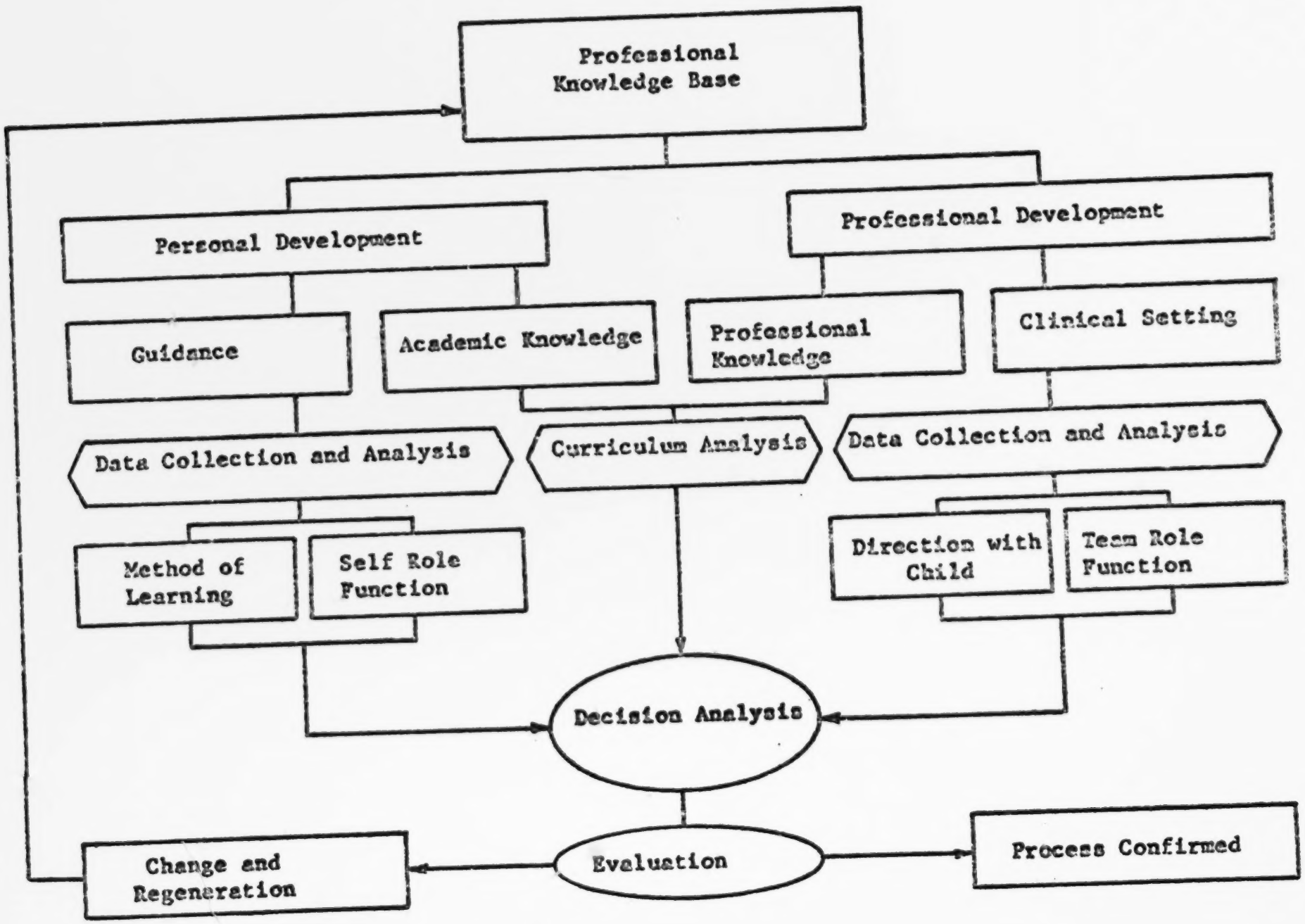


Figure No. 23. Program Regeneration System

THE UNIVERSITY OF PITTSBURGH MODEL OF TEACHER TRAINING FOR THE INDIVIDUALIZATION OF INSTRUCTION

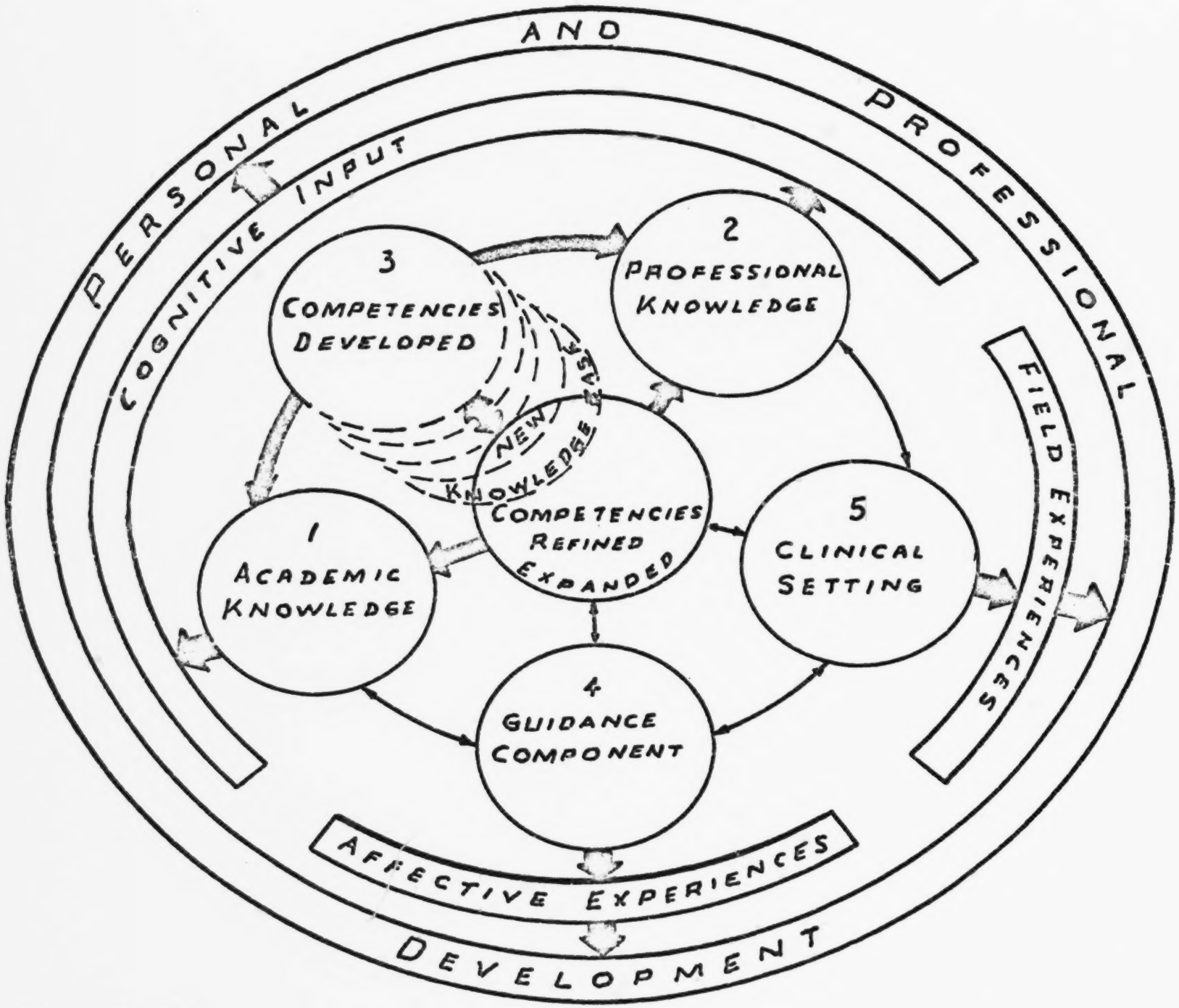
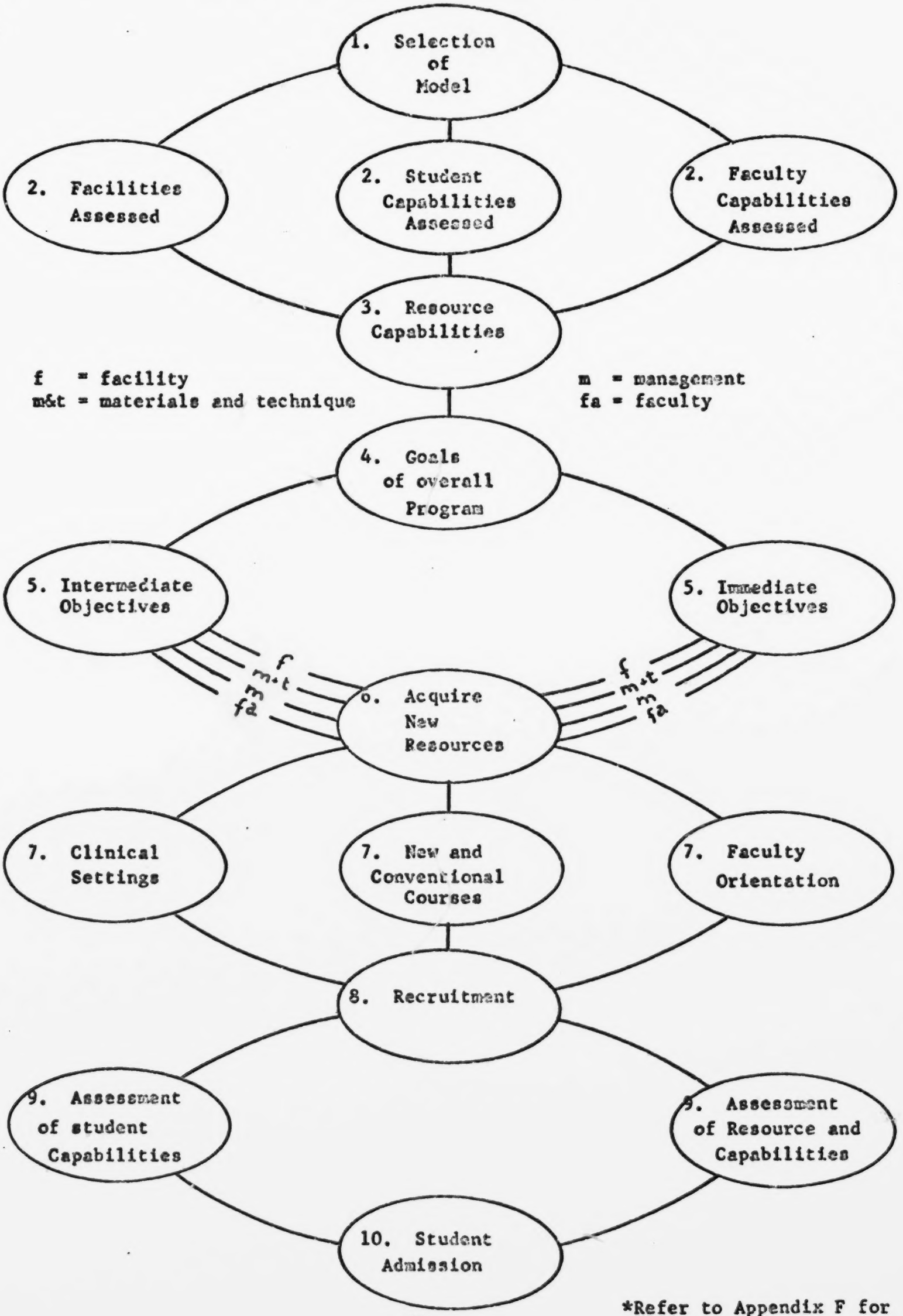


Figure No. 22.

GESTALT

Figure No. 24. University Implementation of the Pittsburgh Model. Sequence of Events



*Refer to Appendix F for Estimated Cost Analysis.

IV. Estimated Costs of University Implementation

Rationale for Estimating Costs for Implementation

This budget approach is functional, based on the probable costs of operational units of the implementation process plus the space in which to conduct the operations. It is intended to supply a prospective user with information necessary to develop a budget appropriate for his local situation. The five major cost sources, functionally stated, are Administration and Coordination, Instructional Materials Development, Retraining Faculty, Space and Evaluation. All five can be expected to have high initial costs which will then taper off to maintenance levels. Since the full implementation of the model has not been attempted, the cost estimate below have not been validated and are subject to an uncertain degree of error. Therefore, it would be appropriate to make proper allowance for exchange of funds among functional units and to provide reasonably for contingencies.

1. Instructional Materials Development: Many specialized materials will be needed to implement individualization. Some materials can be bought and used almost "as is." Others can be adapted from commercially available items. Some must be created, all will involve cost, the last the most. Relatively little seems available for use "as is", perhaps 20% of what is needed. Another 70% could be adapted from commercial texts, films and other material, using programmers and unit writers to do the modification. That leaves 10% to be created, - that is, designed from scratch.

Instructional materials design and development and adaptation will probably account for the greatest single outlay of money in the first few years of implementation. The only hard basis for projections at hand is the cost for creating instructional materials in I.P.I. That, according to the Learning Research & Development Center staff, is $3,000.00 per clock hour of elementary school instruction. We are assuming that figure applies also for the creation of materials for higher education. We are assuming, further, that modification and adaptation of commercial material for individualization will cost approximately $500.00 per clock hour of instruction, and that "as is" material will need initial servicing to the extent of $100.00 per instructional clock hour. The above estimates include both the development of the materials and their maintenance in operation with trainees during the tooling-up period.

Assuming approximately 1800 clock hours of instruction make up a four year collegiate program and that the goal is to individualize 1200 of those hours, the following costs can be estimated:

Amount and Type of Material	Instructional Hours		Development Cost Per Hour		Cost Estimates
20% (As is)	240	x	$ 100.00	=	$ 24,000.00
70% (Adapted)	840	x	500.00	=	420,000.00
10% (Created)	120	x	3,000.00	=	360,000.00
TOTAL					804,000.00

When all the individualized instructional materials are available for use, it is estimated that it will cost $40.00 per instructional hour to maintain and replace materials as needed.

2. Retraining Faculty: Costs for released time and the tutelage of faculty in the use of individualized instruction calls for a large initial outlay and a continuing, tho' lesser, amount for a number of years. It will take on the average 20 hours of individualized instruction and supervision to equip a contemporary college faculty member to use individualized instruction at a satisfactory competency level in every-day teaching of college students. There will, of course, be a range of individual differences among faculty members, and the estimate allows for that. The cost per hour per faculty member is calculated at $50.00, including released time, personnel and materials, or $1,000.00 per faculty member for the initial 20 hours.

3. Administration and Coordination: The initiation of any activity of this complexity calls for a larger investment, at least for a time, in administration and coordination than does the conduct of a well-established program. This includes, for example, the development of the clinical component in the new way described in the specifications. Therefore, it is anticipated that one added professional person for every 50 students will be needed for the first two years, and one for every 100 students thereafter. The cost for one such person, including salary and benefits, space, facilities, secretarial support and travel is estimated at $30,000.00 per year.

4. Space: It is assumed that relatively little change will be needed in the absolute amount of instructional space, on and off campus. Estimating the space increase needed on a per-student basis as 50 square feet to accomodate carrels, laboratories and other essential requirements, and calculating the space footage cost at $5.00 per year, the per-student cost would be $250.00 per year over and above present costs.

5. Evaluation: The nature and extent of the evaluation attempted will influence the cost, and that may vary markedly from one situation to another. Therefore, aside from noting that budgeting for evaluation is necessary, no specific estimates will be made here.

6. General Funding: Cost estimates need to be tested in practice. It should be possible, near the end of the first six months of an implementation project to estimate the next six with much more precision. And with the second six months added, the second year costs should be even more accurately predicted. If funding could be so designed as to take that approach it is likely that the efficiency and effectiveness of the project could be steadily improved, with a resultant favorable relationship between cost and quality.